



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,282	12/12/2003	Philippe Le Tourneur	246399US6	8244

22850 7590 08/09/2006

C. IRVIN MCCLELLAND
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

MONDT, JOHANNES P

ART UNIT	PAPER NUMBER
----------	--------------

3663

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Response to Amendment

Amendment filed 5/15/06 forms the basis for this office action. In said Amendment applicant amended all pending claims 1-23 at least through amendment of independent claim 1. Applicant also replaced the Abstract with a new Abstract. Comments on Remarks submitted with said Amendment are included below under "Response to Arguments".

Election/Restrictions

In response to Applicant's argument that claim 16 was not elected only by error, examiner accepts said argument. Please note that the previous office action also states that claim 16 when elected would have been met by the previous rejections, with details included). Accordingly, claims 1,2,5,6,8,10-13,16 and 18-21 are being examined.

Information Disclosure Statement

The examiner has considered the items listed in the Information Disclosure Statement filed 5/15/06 and 6/22/04 with signed copies of the Forms PTO-1449 herewith enclosed.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. **Claim 6** recites the limitation "the metal hydride" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. ***Claims 1, 8, 10, 12, 13, 16, 18, 20 and 21*** are rejected under 35 U.S.C. 102(b) as being anticipated by Cluzeau (FR 2738 669) (as made of record by Applicant in IDS as item AO).

Cluzeau teaches a target 29/65 (abstract, page 1, line 18 – page 2, line 28, page 12, lines 15-20, showing the mask 65 “very close to” 29 in the relevant embodiment illustrated by Figure 6 (and parallel to it, see Figure 6) and page 3, lines 3-9 and Figures 1, 3 and 6; for element 65 see page 18, lines 27-36 and Figure 6) capable to emit neutrons when bombarded with particles (in particular, ion beam 27 (see abstract)), comprising:

neutron emissive parts (corresponding to the predetermined openings in the mask 65) and neutron non-emissive parts (corresponding to the remainders of the mask not exposed by said openings, as they do not themselves emit neutrons) forming a pattern of the type of that of a coded mask 65 (loc.cit.). Furthermore, the language “only the neutron emissive parts emitting neutrons during the bombardment with particles” constitutes functional language: intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art

Art Unit: 3663

structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto 136 USPQ 458, 459 (CCPA 1963).

On claim 8: the invention by Cluzeau is a particle accelerator (Penning ion source 26 (page 11, lines 5-8, with accelerating electrode 26, loc.cit.)) comprising a target 29/65 according to claim 1 (see rejection of claim 1).

On claim 10: Cluzeau teaches a particle accelerator 26/28 according to claim 8 that it is equipped with α - particle detector (35 or 15/35) (see abstract, first sentence, Figures 1 and 2) associated with the emission of neutrons (the alpha particles and neutrons are emitted in exactly opposite directions and through the same nuclear reaction ${}^3\text{H}(\text{d},\text{n}){}^4\text{He}$ (page 2) by conservation of linear momentum).

On claim 12: the target 29/65 of claim 10 is inclined in relation to the direction of the particles (in the ion beam 27) that are bombarding it (see Figure 2).

On claim 13: the target 29/65 of the particle accelerator according to claim 10 is substantially parallel to the α particle detector 35 (Figure 6).

On claims 16 and 18: The device by Cluzeau contains a neutron generating tube 21 comprising a target 29/65 (N.B.: claim 16 is thus seen to be met) and is equipped with a particle detector 15/35 associated with the emission of neutrons (the alpha particles and neutrons are emitted in exactly opposite directions and through the same nuclear reaction ${}^3\text{H}(\text{d},\text{n}){}^4\text{He}$ (page 2) by conservation of linear momentum).

On claim 20: the target 29/65 is inclined in relation to the direction of the particles (in the ion beam 27) that are bombarding it (see Figure 2).

On claim 21: the target 29/65 is substantially parallel to the α particle detector 35 (Figure 6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. ***Claims 2, 5 and 6*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cluzeau (as cited above for claim 1) in view of Fabian (German patent document 2053881) (made of record in IDS as item AP) (cited in previous action).

On claim 2: Cluzeau anticipates claim 1, as detailed above.

Cluzeau teaches the emissive part to be formed of titanium.

Cluzeau does not necessarily teach the further limitation that said emissive part to be formed from at least one metal hydride deposited on a support in non-hydrogen fixing material through a stencil.

However, it would have been obvious to include said further limitation in view of Fabian, who, in a patent document on neutron targets, hence analogous art, teach as ordinary in the art the selection of a target of titanium hydride deposited on a non-hydrogen fixing material (copper) (see page 2, first paragraph).

In reference to the claim language referring to "formed...through a stencil", intended use and other types of functional language must result in a structural

Art Unit: 3663

difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963).

Motivation to include the teaching by Fabian on metal hydride in the invention by Cluzeau derives from the advantage to impregnate the best metal for this purpose (see page 2, third paragraph) with high hydrogen content so as to increase the density of the true targets, which are the hydrogen isotope atoms therein while copper has the desired high thermal conductivity, as expressed by Fabian (page 2, first paragraph).

On claim 5: in the combined invention as detailed and rendered obvious above under claim 2 the non-fixing material of the support is copper (see Fabian, page 2, first paragraph).

On claim 6: this rejection is offered subject to the noted indefiniteness, assuming the claim language includes metal hydride according to claim 2. In the combined invention the metal of the metal hydride is titanium, thus meeting this further limitation.

3. **Claims 11 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cluzeau (as cited for claim 10) in view of Kassing (DE 3049153 A1) (cited in previous action).

Cluzeau anticipates claim 10, as detailed above. Cluzeau does not necessarily teach the further limitation defined by claim 11. However, it would have been obvious to include said further limitation in view of Kassing, who, in the art of alpha particle detectors teach the alpha particle detector to be a semiconductor storage matrix (claim

Art Unit: 3663

1 in Kassing) (see also Derwent translation of abstract and equivalent abstract included herewith) connected to an electrical circuit. The pixels by definition are the units of electrical response to the detected alpha particles. *Motivation* to include the teaching by Kassing derives from the efficient spatial resolution obtained in the semiconductor alpha particle detector.

On claim 19: Cluzeau does not necessarily teach the further limitation defined by claim 19. *However, it would have been obvious to include said further limitation in view of Kassing*, who, in the art of alpha particle detectors teach the alpha particle detector to be a semiconductor storage matrix (claim 1 in Kassing) (see also Derwent translation of abstract and equivalent abstract included herewith) connected to an electrical circuit. The pixels by definition are the units of electrical response to the detected alpha particles. *Motivation* to include the teaching by Kassing derives from the efficient spatial resolution obtained in the semiconductor alpha particle detector.

Response to Arguments

Applicant's arguments filed 5/15/06 have been fully considered but they are not persuasive.

With regard to comments on page 9-10 of Remarks in traverse of the objection to the Specification (pages 2-3) for lack of written description and indefiniteness: applicant does not fully address the noted lack of written description based on the definition of coded mask as a "mask pierced with a plurality of holes in a more or less random manner" (more or less in italics and underscore added by examiner for emphasis) because the "more or less random" nature of the mask code lacks description and,

Art Unit: 3663

counter to applicant's allegation with reference to Lanza and Fenimore (see IDS submitted after the previous office action) is not known from the art. Applicant merely alleges said references to define a "coded mask", but they do not precisely define a more or less randomly coded mask":

(1) Lanza describes "pseudo-random" coding (see col. 10, l. 30-33), but "pseudo-random" is not at all "random", only seemingly so (see, for instance Merriam-Webster's Collegiate Dictionary, 10th Edition (1998), page 941: "pseudo" meaning "being apparently rather than actually as stated"), thus in sharp contrast with applicant's definition.

(2) However, Fenimore does make reference to the inventions by Dicke and Abels using randomly arranged pinholes, albeit not arranged or coded in a more or less random manner.

In light of the above, "coded mask" is interpreted without a random component to the coding, and any randomness requiring disclosure of the nature of the randomness not disclosed in the original specification, and when claimed would prompt rejections under 35 U.S.C. 112. With this proviso, and in light of the amendment to abstract and claim 1 the rejections under 35 USC 112, first and second paragraph, have been withdrawn.

The objection to claim 5 is withdrawn in light of the amendment.

Arguments in traverse of the rejection under 35 USC 103(b) over Cluzeau, and rejections under 35 USC 103(a) over Clauzeau in view of Fabian and Kassing with Cluzeau as primary reference are not persuasive: first, element 65 had been cited for

Art Unit: 3663

the coded mask, not 36. Second, counter to applicant's allegation of having not provided a reference for element 65, the action specifically refers to page 18, lines 27-36 for the coded mask; see page 6 of the previous office action. A translation has been ordered from the USPTO translation services and shall be sent by fax once available. However, it is understood that applicant reads French. Third, counter to applicant's allegation that the coded mask by Cluzeau "is intended to block partially the alpha particles and not the emission of neutrons", neutron emission takes places substantially only where the ion beam directly intersects the emissive target material. The coded mask by Cluzeau is capable, by applicant's admission and in view of the text cited, to block the alpha particles. The energy of the alpha particles is in the case of deuteron-deuteron fusion equal to 0.8 MeV ([0008], and [0052], e.g.) (and in the case of deuterium-tritium fusion even higher, i.e., 2.45 MeV; see [0068] in the specification, for instance) and the material constitution of a coded mask as specifically recited is a 0.1 mm Al slab (or plate) ("plaque") (page 12 of Cluzeau). The energy of the alpha particle thus greatly exceeds the energy of the ion beam needed to produce either D-D or D-T fusion (see page 11 of Cluzeau) while a plate or slab of Al does not allow the substantial penetration of even a hydrogen beam over 0.06 mm at energies below 10 MeV (see, for example *Fujimaki*, US 2002/0150337 A1) ([0138]). Therefore, said coded mask by Cluzeau a fortiori is also capable of substantially blocking entrance in selected portions through coding of the ion beam and thus creates a division of parts that are high and parts that are low in neutron emission. It is therefore concluded that the rejection under 35 U.S.C. 102(b) over Cluzeau must be maintained after amendment.

Finally, it appears that the rejection of claim 6 has not been addressed, either by amendment nor by traverse, and hence is repeated here: the basis for this rejection is simply the persistent occurrence of “metal hydride” without antecedent basis.

Parenthetically, that “only the neutron emissive parts” “are emitting neutrons during the bombardment with particles” as recited is only supported by the specification *provided* the non-emissive parts of the target are interpreted as being the mask material, because even portions of the neutron-emissive material straight underneath the mask receive some, admittedly low, level of energetic beam particles through elastic and non-elastic collisions of said beam particles with uncovered neutron-emissive material and with each other (see *Sawa et al* (5,076,993)), and thus contribute to the total neutron flux. Within the context of the invention as disclosed in the specification nothing can prevent this from happening.

The rejections overleaf were based on the above considerations.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

Art Unit: 3663

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM
July 22, 2006

Patent Examiner:


Johannes Mondt (Art Unit: 3663)